



HP Precision Architecture UNIX MAINSAIL®

Installation and Release Notes

Version 12.15

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XIDAK

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1. Introduction

This document describes MAINSAIL version 12.15 running on HP Precision Architecture UNIX.

Accompanying the document is a tape containing the files necessary for installing this version of MAINSAIL. Instructions for installing MAINSAIL can be found in Chapter 3.

If you encounter difficulties, please contact XIDAK Customer Support at (415) 855-9271 between 8:00 A.M. and 5:00 P.M. Pacific Time, Monday through Friday, or by FAX at (415) 855-9005.

2. System Abbreviations

The abbreviation for the HP Precision Architecture processor is "PA". This abbreviation is used by MAINSAIL to construct the names of the code generator for the HP Precision Architecture ("MPAG") and the machine-dependent disassembler module ("PAD").

The abbreviation for UNIX systems on the HP Precision Architecture processor is "UPA" ("U" for "UNIX" followed by "PA" for the HP Precision Architecture processor). This abbreviation is used in the MAINSAIL compiler's "TARGET" subcommand, to indicate that it should generate object modules that will run on a UNIX system on the HP Precision Architecture. The first three letters of the abbreviation, converted to lower case ("upa"), are used in the target system part of the default names of object files and libraries, and intmod files and libraries.

The platform abbreviation for HP Precision Architecture UNIX is hppa. The platform abbreviation is specified when MAINSAIL is installed.

3. Installing MAINSAIL

Before anyone can run MAINSAIL, it needs to be "installed", as described below.

3.1. MAINSAIL Directory

Create a directory, herein called the MAINSAIL directory, that will contain the files comprising the MAINSAIL system. The directory can have any name, but we recommend including the word "MAINSAİL" and the MAINSAİL version number. This document assumes that the directory is named "/usr/mainsail/12.15". If another directory name is used, it should be substituted for "/usr/mainsail/12.15" in all the examples in this document.

Example 3.1-1 shows how to create and connect to the MAINSAİL directory on HP Precision Architecture UNIX. The percent signs shown in the examples are the UNIX shell's prompts.

```
% mkdir /usr/mainsail/12.15<eol>
% cd /usr/mainsail/12.15<eol>
```

Example 3.1-1. Creating and Connecting to the MAINSAİL Directory

3.2. Reading the MAINSAİL System from Tape

After connecting to the MAINSAİL directory, read the files from the tape that accompanied this document. The tape is either:

- A "tar"-format half-inch nine-track (industry standard) magnetic tape at 1600 or 6250 BPI, or
- A "tar"-format quarter-inch cartridge tape

Before trying to read files from a half-inch nine-track tape, make sure that the tape drive is set to read the correct density (either 1600 or 6250 bpi).

Example 3.2-1 shows how to extract the MAINSAİL files from the tape.

```
<Mount Tape on Tape Drive>
```

```
% tar xfv <tapeDevice><eol>
```

```
where <tapeDevice> is the device that is associated with  
the tape drive (e.g., "/dev/rmt0").
```

Example 3.2-1. Extracting MAINSAIL from Tape

At this point, the MAINSAIL files have been read from the installation tape onto the MAINSAIL directory.

3.3. Installing MAINSAIL

After the files have been read from the installation tape onto the MAINSAIL directory, MAINSAIL is installed by running the C-shell script file named ihppa.com, otherwise known as the installation script.

Example 3.3-1 shows how to install MAINSAIL on HP Precision Architecture UNIX.

```
% chmod +x *.com<eol>  
% ihppa.com<eol>  
%
```

Example 3.3-1. Installing MAINSAIL

After the installation script is run, MAINSAIL has been installed. Two executable bootstraps named "mainsa" and "mained" have been created. These bootstraps are the UNIX programs you must run in order to invoke MAINSAIL. "mained" invokes MAINEDIT, for people who don't like having to run MAINSAIL and explicitly typing "edit" to run MAINEDIT.

Be sure to change the protections of the files on the MAINSAIL directory so that they can be read and executed by the appropriate users. Ordinary users will not usually need write access to any of the files on the MAINSAIL directory. Consult the description of the "chmod" (change file protection mode) command in the UNIX documentation.

As a final step, you may wish to place the bootstrap(s) on a directory in the search path of most users, e.g., "/usr/bin". This allows users to run MAINSAIL by typing "mainsa". Otherwise, the full path name of each bootstrap (e.g., "/usr/mainsail/12.15/mainsa") must be used. Note that the bootstrap files (i.e., "mainsa" and "mained") need not be on the same directory as the rest of the MAINSAIL files.

If the MAINSAIL directory is renamed (or the MAINSAIL files are moved to a new directory), MAINSAIL must be reinstalled by running the installation script again as shown in Example 3.3-1, since the pathname of the directory is hardwired into the bootstraps. Be sure to connect to the new MAINSAIL directory before running the installation script.

4. Making New Bootstraps

The name of the standard configuration file for MAINSAIL on a given platform is the platform name in lower case followed by ".cnf" (i.e., hppa.cnf) on the MAINSAIL directory. If you wish to change any of the standard configuration parameters, you must make a new bootstrap. The steps to do so are described below.

The examples in this chapter assume that the bootstrap file created by CONF is named "mainsa.s". If its name is different, the actual name should be substituted for "mainsa.s" in all the examples in this chapter.

Run CONF and set the configuration parameters as desired. See the "MAINSAIL Utilities User's Guide" for a description of CONF. When you're finished, exit to the UNIX shell.

Example 4-1 shows how to compile and link a new bootstrap, assuming that the above steps have been done. Note that the output from conf cannot be assembled with the "as" command. Doing so results in error messages to the effect:

```
as: ... Label not allowed here in this expr - r18
```

You must instead specify the name of the file produced by conf as part of the "cc" command used to make the executable bootstrap.

```
% cc -o mainsa mainsa.s /usr/mainsail/12.15/m.o<eol>
%
```

Example 4-1. Compiling and Linking a New Bootstrap

At this point, a new executable bootstrap named "mainsa" has been created on the current directory. This file is the UNIX program to run in order to invoke a version of MAINSAIL having the new configuration parameter values.

5. Foreign Language Interface

This chapter describes aspects of the foreign language interface that are specific to HP Precision Architecture UNIX. See the "MAINSAIL Compiler User's Guide" for a general description of the foreign language interface, and see the "Foreign Language Interface" chapter in the "UNIX MAINSAIL User's Guide" for a description of the foreign language interface on UNIX systems in general.

Calls from MAINSAIL to procedures written in other languages, and from procedures written in other languages to MAINSAIL, are supported as long as the procedures meet the interface described in the "Precision Architecture: Procedure Calling Conventions Reference Manual".

MAINSAIL procedures can be invoked from a foreign language main program. It is not necessary for MAINSAIL to initiate program execution and then call code written in a foreign language.

The FLI compiler by default converts a MAINSAIL procedure name to a foreign label by converting the procedure name to lower case. It does not prepend an underscore. The default conversion may be overridden by means of the "ENCODE" directive, as described in the "MAINSAIL Compiler User's Guide".

MAINSAIL long reals, which correspond to C doubles, are not necessarily aligned on 8-byte boundaries. MAINSAIL booleans, integers, and bits occupy four bytes, whereas C shorts occupy two bytes. Refer to the section titled "C Alignment Considerations" in the "UNIX MAINSAIL User's Guide". The discussion there also applies to HP Precision Architecture UNIX.

The compiler subcommands to specify the FLI's from MAINSAIL to C and from C to MAINSAIL are "FLI TC" and "FLI FC", respectively.

6. HP Precision Architecture-Dependent Information

This chapter describes HP Precision Architecture-specific information.

6.1. Procedure Size

There is no well-defined limit for the size of a procedure on the HP Precision Architecture. However, the compiler almost always successfully compiles procedures under 32K bytes in length. The compiler may handle procedures larger than 32K bytes, depending on the code. Procedures longer than approximately 32K bytes are not guaranteed to work, and such procedures may compile correctly on one machine and not on another.

6.2. HP Precision Architecture MIPS Data Types

Refer to Table 6.2-1. A storage unit on the HP Precision Architecture is one byte (8 bits).

<u>Data type</u>	<u>Representation</u>
boolean	1 long word (4 bytes)
integer	1 long word (4 bytes)
long integer	1 long word (4 bytes)
real	IEEE single precision (4 bytes)
long real	IEEE double precision (8 bytes)
bits	1 long word (4 bytes)
long bits	1 long word (4 bytes)
string	2 long words (8 bytes): first long word (low address) is length, second long word (high address) is charadr of first character
address	1 long word (4 bytes)
charadr	1 long word (4 bytes)
pointer	1 long word (4 bytes)

Table 6.2-1. HP Precision Architecture Data Types

6.3. Miscellaneous Information

The standard representation for boolean FALSE is all bits clear, and the standard for boolean TRUE is low-order bit set, all other bits clear. However, in forms such as "IF <boolean variable> THEN ...", <boolean variable> is considered to be TRUE if any bits are set.

String variables have both the length and charadr component equal to Zero for the string Zero (no characters).